

4705101527



Noble Energy SHL-8G-HS Gyro+MWD 0' to 14158' MD Survey Report
(Def Survey)

Report Date: December 19, 2012 - 09:02 AM
 Client: Noble Energy
 Field: WV Marshall County (NAD 27)
 Structure / Slot: CNX/Noble Energy SHL-8 Pad / SHL-8G-HS
 Well: SHL-8G-HS
 Borehole: Original Borehole
 UWI / API#: Unknown / Unknown
 Survey Name: Noble Energy SHL-8G-HS Gyro+MWD 0' to 14158' MD
 Survey Date: December 03, 2012
 Tort / AHD / DDI / ERD Ratio: 225.511 ° / 8640.209 ft / 6.624 / 1.317
 Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet
 Location Lat / Long: N 39° 57' 19.78674", W 80° 32' 8.32305"
 Location Grid N/E Y/X: N 531805.190 RUS, E 1709673.447 RUS
 CRS Grid Convergence Angle: -0.6605 °
 Grid Scale Factor: 0.99995724

Survey / DLS Computation: Minimum Curvature / Lubinski
 Vertical Section Azimuth: 332.696 ° (Grid North)
 Vertical Section Origin: 0.000 ft, 0.000 ft
 TVD Reference Datum: KB
 TVD Reference Elevation: 1149.270 ft above MSL
 Seabed / Ground Elevation: 1131.470 ft above MSL
 Magnetic Declination: -8.712 °
 Total Gravity Field Strength: 999.3811mgn (9.80665 Based)
 Total Magnetic Field Strength: 52769.955 nT
 Magnetic Dip Angle: 67.444 °
 Declination Date: December 03, 2012
 Magnetic Declination Model: BGM 2012
 North Reference: Grid North
 Grid Convergence Used: -0.6605 °
 Total Corr Mag North->Grid North: -8.0512 °
 Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
SHL	0.00	0.00	0.00	0.00	-1149.27	0.00	0.00	0.00	N/A	N/A	N/A	531805.19	1709673.45	N 39 57 19.79	W 80 32 8.32	0.00
	106.50	0.60	200.53	106.50	-1042.77	-0.37	-0.52	-0.20	0.56	0.56	0.00	531804.67	1709673.25	N 39 57 19.78	W 80 32 8.33	0.00
	206.50	0.48	196.12	206.49	-942.78	-1.03	-1.41	-0.50	0.13	-0.12	-4.41	531803.78	1709672.95	N 39 57 19.77	W 80 32 8.33	0.04
	306.50	0.45	202.61	306.49	-842.78	-1.59	-2.18	-0.76	0.06	-0.03	6.49	531803.01	1709672.68	N 39 57 19.77	W 80 32 8.33	0.26
	406.50	0.41	196.91	406.49	-742.78	-2.10	-2.88	-1.02	0.06	-0.04	-5.70	531802.31	1709672.43	N 39 57 19.76	W 80 32 8.34	0.41
	506.50	0.27	204.45	506.49	-642.78	-2.50	-3.44	-1.22	0.15	-0.14	7.54	531801.75	1709672.23	N 39 57 19.75	W 80 32 8.34	0.56
	606.50	0.54	182.86	606.48	-542.79	-3.05	-4.13	-1.34	0.31	0.27	-21.59	531801.06	1709672.11	N 39 57 19.75	W 80 32 8.34	0.75
	706.50	0.42	167.14	706.48	-442.79	-3.81	-4.95	-1.28	0.18	-0.12	-15.72	531800.24	1709672.16	N 39 57 19.74	W 80 32 8.34	0.88
	806.50	0.40	160.49	806.48	-342.79	-4.52	-5.64	-1.08	0.05	-0.02	-6.65	531799.55	1709672.36	N 39 57 19.73	W 80 32 8.34	0.95
	906.50	0.62	143.38	906.47	-242.80	-5.39	-6.40	-0.64	0.27	0.22	-17.11	531798.79	1709672.80	N 39 57 19.72	W 80 32 8.33	1.08
	1006.50	0.58	138.40	1006.47	-142.80	-6.42	-7.22	0.01	0.07	-0.04	-4.98	531797.97	1709673.46	N 39 57 19.72	W 80 32 8.32	1.16
	1106.50	0.51	145.43	1106.46	-42.81	-7.35	-7.96	0.60	0.10	-0.07	7.03	531797.23	1709674.05	N 39 57 19.71	W 80 32 8.31	1.23
	1206.50	0.60	136.73	1206.46	57.19	-8.30	-8.71	1.21	0.12	0.09	-8.70	531796.48	1709674.66	N 39 57 19.70	W 80 32 8.31	1.31
	1306.50	0.45	143.68	1306.45	157.18	-9.19	-9.41	1.81	0.16	-0.15	6.95	531795.78	1709675.25	N 39 57 19.69	W 80 32 8.30	1.38
	1406.50	0.27	144.21	1406.45	257.18	-9.81	-9.91	2.18	0.18	-0.18	0.53	531795.28	1709675.62	N 39 57 19.69	W 80 32 8.29	1.44
	1506.50	0.25	134.83	1506.45	357.18	-10.25	-10.26	2.47	0.05	-0.02	-9.38	531794.93	1709675.92	N 39 57 19.69	W 80 32 8.29	1.46
	1606.50	0.46	138.41	1606.45	457.18	-10.85	-10.71	2.89	0.21	0.21	3.58	531794.48	1709676.34	N 39 57 19.68	W 80 32 8.28	1.52
	1706.50	0.38	135.89	1706.45	557.18	-11.55	-11.25	3.39	0.08	-0.08	-2.52	531793.94	1709676.83	N 39 57 19.68	W 80 32 8.28	1.56
	1806.50	0.36	145.04	1806.44	657.17	-12.18	-11.75	3.80	0.06	-0.02	9.15	531793.44	1709677.24	N 39 57 19.67	W 80 32 8.27	1.59
	1906.50	0.35	149.62	1906.44	757.17	-12.80	-12.27	4.13	0.03	-0.01	4.58	531792.92	1709677.58	N 39 57 19.67	W 80 32 8.27	1.61
	2006.50	0.37	159.75	2006.44	857.17	-13.42	-12.84	4.40	0.07	0.02	10.13	531792.36	1709677.85	N 39 57 19.66	W 80 32 8.26	1.64
	2106.50	0.20	210.82	2106.44	957.17	-13.91	-13.25	4.64	0.21	-0.17	-27.93	531791.94	1709678.09	N 39 57 19.66	W 80 32 8.26	1.69
	2206.50	0.09	275.54	2206.44	1057.17	-14.03	-13.36	4.69	0.28	-0.11	143.72	531791.83	1709678.14	N 39 57 19.66	W 80 32 8.26	1.73
	2306.50	0.10	57.11	2306.44	1157.17	-13.98	-13.31	4.69	0.18	0.01	141.57	531791.88	1709678.13	N 39 57 19.66	W 80 32 8.26	1.75
	2406.50	0.38	117.96	2406.44	1257.17	-14.24	-13.42	5.05	0.34	0.28	60.85	531791.77	1709678.50	N 39 57 19.65	W 80 32 8.26	1.80

02/28/2014

4705101527

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S °.')	Longitude (EW °.')	Directional Difficulty Index
	2506.50	0.29	71.89	2506.44	1357.17	-14.55	-13.49	5.59	0.27	-0.09	-46.07	531791.70	1709679.03	N 39 57 19.65 W	80 32 8.25	1.85
	2606.50	0.19	64.42	2606.44	1457.17	-14.60	-13.34	5.98	0.10	-0.10	-7.47	531791.85	1709679.42	N 39 57 19.66 W	80 32 8.24	1.87
	2706.50	0.30	59.87	2706.43	1557.16	-14.59	-13.14	6.35	0.11	0.11	-4.55	531792.05	1709679.80	N 39 57 19.66 W	80 32 8.24	1.89
	2806.50	0.42	82.54	2806.43	1657.16	-14.70	-12.96	6.94	0.18	0.12	22.67	531792.23	1709680.39	N 39 57 19.66 W	80 32 8.23	1.92
	2839.50	0.60	88.10	2839.43	1690.16	-14.82	-12.94	7.24	0.57	0.55	16.85	531792.25	1709680.68	N 39 57 19.66 W	80 32 8.23	1.95
	3076.00	0.56	60.69	3075.92	1926.65	-15.31	-12.33	9.48	0.12	-0.02	-11.59	531792.86	1709682.93	N 39 57 19.67 W	80 32 8.20	2.02
	3119.00	0.86	34.95	3118.92	1969.65	-15.15	-11.97	9.85	1.00	0.70	-59.86	531793.23	1709683.30	N 39 57 19.67 W	80 32 8.19	2.07
	3167.00	1.30	45.44	3166.91	2017.64	-14.82	-11.29	10.44	1.00	0.92	21.85	531793.90	1709683.89	N 39 57 19.68 W	80 32 8.19	2.12
	3213.00	1.74	39.91	3212.89	2063.62	-14.40	-10.39	11.26	1.01	0.96	-12.02	531794.80	1709684.71	N 39 57 19.69 W	80 32 8.18	2.18
	3259.00	2.34	35.85	3258.86	2109.59	-13.70	-9.09	12.26	1.34	1.30	-8.83	531796.10	1709685.71	N 39 57 19.70 W	80 32 8.16	2.25
	3308.00	3.21	36.09	3307.80	2158.53	-12.63	-7.17	13.65	1.78	1.78	0.49	531798.02	1709687.10	N 39 57 19.72 W	80 32 8.15	2.34
	3356.00	4.07	34.68	3355.71	2206.44	-11.23	-4.68	15.42	1.80	1.73	-2.94	531800.51	1709688.86	N 39 57 19.74 W	80 32 8.12	2.43
	3404.00	4.90	37.16	3403.56	2254.29	-9.55	-1.65	17.62	1.78	1.79	5.17	531803.54	1709691.07	N 39 57 19.77 W	80 32 8.10	2.52
	3451.00	5.74	36.77	3450.36	2301.09	-7.66	1.83	20.24	1.79	1.79	-0.83	531807.02	1709693.69	N 39 57 19.81 W	80 32 8.06	2.61
	3498.00	6.06	31.74	3497.11	2347.84	-5.35	5.83	22.95	1.29	0.68	-10.70	531811.02	1709696.40	N 39 57 19.85 W	80 32 8.03	2.68
	3546.00	5.10	25.51	3544.88	2395.61	-2.76	9.91	25.21	2.36	-2.00	-12.98	531815.10	1709698.65	N 39 57 19.89 W	80 32 8.00	2.77
	3593.00	4.52	21.73	3591.72	2442.45	-0.28	13.51	26.79	1.41	-1.23	-8.04	531818.70	1709700.24	N 39 57 19.92 W	80 32 7.98	2.83
	3640.00	3.62	16.33	3638.60	2489.33	2.01	16.66	27.89	2.08	-1.91	-11.49	531821.85	1709701.34	N 39 57 19.95 W	80 32 7.97	2.89
	3687.00	3.55	13.89	3685.50	2536.23	4.17	19.49	28.66	0.36	-0.15	-5.19	531824.68	1709702.11	N 39 57 19.98 W	80 32 7.96	2.91
	3735.00	3.34	6.15	3733.42	2584.15	6.46	22.33	29.17	1.06	-0.44	-16.13	531827.52	1709702.61	N 39 57 20.01 W	80 32 7.95	2.95
	3782.00	2.95	8.23	3780.35	2631.08	8.59	24.88	29.49	0.86	-0.83	4.43	531830.07	1709702.93	N 39 57 20.04 W	80 32 7.95	2.98
	3830.00	2.13	7.97	3828.30	2679.03	10.32	26.99	29.79	1.71	-1.71	-0.54	531832.18	1709703.23	N 39 57 20.06 W	80 32 7.94	3.02
	3877.00	1.22	12.94	3875.28	2726.01	11.41	28.34	30.02	1.96	1.02	39.69	531833.53	1709703.47	N 39 57 20.07 W	80 32 7.94	3.05
	3924.00	1.24	6.24	3922.27	2773.00	12.22	29.34	30.19	0.31	0.04	-14.26	531834.53	1709703.63	N 39 57 20.08 W	80 32 7.94	3.06
	3972.00	0.83	4.93	3970.26	2820.99	12.95	30.20	30.28	0.86	-0.85	-2.73	531835.39	1709703.72	N 39 57 20.09 W	80 32 7.94	3.08
	4019.00	0.90	349.26	4017.25	2867.98	13.59	30.90	30.24	0.52	0.15	-33.34	531836.09	1709703.68	N 39 57 20.10 W	80 32 7.94	3.09
	4066.00	0.69	6.16	4064.25	2914.98	14.18	31.55	30.20	0.67	-0.45	35.96	531836.73	1709703.64	N 39 57 20.10 W	80 32 7.94	3.10
	4114.00	1.18	25.21	4112.24	2962.97	14.72	32.28	30.44	1.20	1.02	51.74	531837.47	1709703.88	N 39 57 20.11 W	80 32 7.94	3.12
	4161.00	1.57	49.53	4159.23	3009.96	15.16	33.14	31.13	1.48	0.83	51.74	531838.32	1709704.58	N 39 57 20.12 W	80 32 7.93	3.14
	4215.00	2.61	61.33	4213.19	3063.92	15.36	34.21	32.78	2.07	1.93	21.85	531839.39	1709706.22	N 39 57 20.13 W	80 32 7.91	3.18
	4256.00	3.79	66.13	4254.13	3104.86	15.30	35.20	34.83	2.95	2.88	11.71	531840.39	1709708.28	N 39 57 20.14 W	80 32 7.88	3.22
	4303.00	5.03	67.43	4300.99	3151.72	15.04	36.62	38.16	2.65	2.64	2.77	531841.81	1709711.60	N 39 57 20.15 W	80 32 7.84	3.26
	4350.00	6.86	65.53	4347.73	3198.46	14.73	38.57	42.62	3.92	3.89	-4.04	531843.76	1709716.06	N 39 57 20.17 W	80 32 7.78	3.32
	4395.00	8.52	63.07	4392.33	3243.06	14.57	41.20	48.03	3.76	3.69	-5.47	531846.39	1709721.48	N 39 57 20.20 W	80 32 7.71	3.38
	4440.00	10.26	61.63	4436.72	3287.45	14.63	44.61	54.53	3.90	3.87	-3.20	531849.80	1709727.98	N 39 57 20.23 W	80 32 7.63	3.44
	4485.00	12.20	59.90	4480.86	3331.59	14.93	48.90	62.17	4.38	4.31	-3.84	531854.09	1709735.62	N 39 57 20.28 W	80 32 7.53	3.51
	4530.00	13.87	58.24	4524.70	3375.43	15.58	54.13	70.87	3.80	3.71	-3.69	531859.31	1709744.32	N 39 57 20.33 W	80 32 7.42	3.57
	4574.00	15.59	57.50	4567.25	3417.98	16.53	60.08	80.35	3.93	3.91	-1.68	531865.27	1709753.79	N 39 57 20.39 W	80 32 7.30	3.63
	4619.00	16.96	56.61	4610.45	3461.18	17.77	66.94	90.93	3.09	3.04	-1.98	531872.13	1709764.37	N 39 57 20.46 W	80 32 7.17	3.69
	4664.00	18.38	55.94	4653.32	3504.05	19.30	74.53	102.28	3.19	3.16	-1.49	531879.71	1709775.73	N 39 57 20.53 W	80 32 7.02	3.75
	4709.00	19.72	54.94	4695.86	3546.59	21.16	82.86	114.38	3.06	2.98	-2.22	531888.05	1709787.82	N 39 57 20.62 W	80 32 6.87	3.81
	4753.00	20.88	53.47	4737.13	3587.86	23.42	91.79	126.75	2.88	2.64	-3.34	531896.98	1709800.20	N 39 57 20.71 W	80 32 6.71	3.86
	4797.00	22.03	51.88	4778.08	3628.81	26.23	101.55	139.55	2.93	2.61	-3.61	531906.74	1709812.99	N 39 57 20.81 W	80 32 6.55	3.91
	4843.00	23.34	51.61	4820.52	3671.25	29.60	112.54	153.48	2.86	2.85	-0.59	531917.72	1709826.92	N 39 57 20.92 W	80 32 6.37	3.96
	4887.00	24.71	51.57	4860.70	3711.43	33.05	123.67	167.51	3.11	3.11	-0.09	531928.85	1709840.95	N 39 57 21.03 W	80 32 6.19	4.01
	4932.00	26.10	52.57	4901.35	3752.08	36.61	135.53	182.74	3.23	3.09	2.22	531940.72	1709856.18	N 39 57 21.15 W	80 32 6.00	4.06
	4977.00	27.55	52.60	4941.51	3792.24	40.17	147.87	198.87	3.22	3.22	0.07	531953.05	1709872.31	N 39 57 21.27 W	80 32 5.79	4.10
	5022.00	28.92	52.42	4981.15	3831.88	43.94	160.83	215.76	3.05	3.04	-0.40	531966.01	1709889.20	N 39 57 21.40 W	80 32 5.58	4.15

4705101527

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° °')	Longitude (E/W ° °')	Directional Difficulty Index
	5066.00	30.16	51.86	5019.43	3870.16	47.91	174.14	232.89	2.89	2.82	-1.27	531979.32	1709906.32	N 39 57 21.53 W	80 32 5.36	4.19
	5112.00	31.51	51.03	5058.93	3909.66	52.52	188.84	251.32	3.08	2.93	-1.80	531994.02	1709924.76	N 39 57 21.68 W	80 32 5.12	4.24
	5156.00	30.42	49.84	5096.66	3947.39	57.32	203.26	268.78	2.84	-2.48	-2.70	532008.44	1709942.21	N 39 57 21.83 W	80 32 4.90	4.28
	5201.00	28.56	48.45	5135.83	3986.56	62.50	217.74	285.54	4.40	-4.13	-3.09	532022.92	1709958.97	N 39 57 21.97 W	80 32 4.69	4.32
	5246.00	27.73	50.70	5175.51	4026.24	67.32	231.51	301.69	2.99	-1.84	5.00	532036.69	1709975.12	N 39 57 22.11 W	80 32 4.48	4.35
	5290.00	27.96	54.43	5214.41	4065.14	70.94	243.99	318.00	3.99	0.52	8.48	532049.17	1709991.43	N 39 57 22.23 W	80 32 4.28	4.39
	5335.00	28.72	54.55	5254.02	4104.75	73.98	256.40	335.39	1.69	1.69	0.27	532061.58	1710008.82	N 39 57 22.36 W	80 32 4.05	4.42
	5380.00	29.51	53.31	5293.34	4144.07	77.32	269.29	353.09	2.21	1.76	-2.76	532074.47	1710026.52	N 39 57 22.49 W	80 32 3.83	4.44
	5425.00	30.43	53.06	5332.32	4183.05	81.04	282.76	371.08	2.06	2.04	-0.56	532087.94	1710044.51	N 39 57 22.62 W	80 32 3.60	4.47
	5470.00	31.41	53.59	5370.92	4221.65	84.80	296.57	389.63	2.26	2.18	1.18	532101.75	1710063.06	N 39 57 22.76 W	80 32 3.36	4.50
	5514.00	32.54	54.66	5408.25	4258.98	88.27	310.22	408.51	2.87	2.57	2.43	532115.40	1710081.94	N 39 57 22.90 W	80 32 3.12	4.53
	5559.00	31.85	53.34	5446.33	4297.06	91.89	324.31	427.91	2.19	-1.53	-2.93	532129.49	1710101.33	N 39 57 23.04 W	80 32 2.88	4.55
	5604.00	31.58	52.04	5484.61	4335.34	96.00	338.65	446.72	1.63	-0.60	-2.89	532143.82	1710120.15	N 39 57 23.18 W	80 32 2.64	4.58
	5647.00	30.33	51.44	5521.48	4372.21	100.20	352.34	464.09	2.99	-2.91	-1.40	532157.52	1710137.51	N 39 57 23.32 W	80 32 2.42	4.60
	5692.00	29.77	51.94	5560.43	4411.16	104.51	366.31	481.77	1.36	-1.24	1.11	532171.49	1710155.19	N 39 57 23.46 W	80 32 2.19	4.62
	5738.00	30.16	53.73	5600.29	4451.02	108.44	380.19	500.08	2.12	0.85	3.89	532185.36	1710173.50	N 39 57 23.60 W	80 32 1.96	4.65
	5782.00	30.84	54.22	5638.20	4488.93	111.82	393.32	518.14	1.65	1.55	1.11	532198.49	1710191.56	N 39 57 23.73 W	80 32 1.73	4.66
	5827.00	31.69	54.40	5676.66	4527.39	115.23	406.95	537.11	1.90	1.89	0.40	532212.12	1710210.53	N 39 57 23.87 W	80 32 1.49	4.69
	5871.00	31.92	53.37	5714.06	4564.79	118.78	420.61	555.84	1.34	0.52	-2.34	532225.79	1710229.26	N 39 57 24.01 W	80 32 1.25	4.70
	5917.00	31.93	53.96	5753.10	4603.83	122.60	435.03	575.44	0.68	0.02	1.28	532240.20	1710248.86	N 39 57 24.15 W	80 32 1.00	4.72
	5961.00	31.56	53.87	5790.52	4641.25	126.13	448.66	594.14	0.85	-0.84	-0.20	532253.83	1710267.56	N 39 57 24.29 W	80 32 0.76	4.74
	6006.00	32.33	54.66	5828.70	4679.43	129.62	462.57	613.47	1.95	1.71	1.76	532267.74	1710286.89	N 39 57 24.43 W	80 32 0.51	4.76
	6050.00	33.21	54.68	5865.70	4716.43	132.95	476.34	632.90	2.00	2.00	0.05	532281.51	1710306.32	N 39 57 24.57 W	80 32 0.27	4.77
	6096.00	34.18	54.22	5903.97	4754.70	136.61	491.18	653.66	2.18	2.11	-1.00	532296.34	1710327.08	N 39 57 24.71 W	80 32 0.00	4.79
	6141.00	35.41	54.66	5940.92	4791.65	140.30	506.11	674.55	2.79	2.73	0.98	532311.28	1710347.97	N 39 57 24.86 W	80 31 59.74	4.82
	6185.00	35.36	54.91	5976.79	4827.52	143.80	520.80	695.37	0.35	-0.11	0.57	532325.97	1710368.79	N 39 57 25.01 W	80 31 59.47	4.83
	6229.00	35.57	53.98	6012.63	4863.36	147.47	535.65	716.14	1.32	0.48	-2.11	532340.81	1710389.55	N 39 57 25.16 W	80 31 59.21	4.85
	6274.00	35.22	51.33	6049.32	4900.05	152.01	551.45	736.86	3.50	-0.78	-5.89	532356.62	1710410.27	N 39 57 25.32 W	80 31 58.94	4.87
	6319.00	34.97	42.61	6086.16	4936.89	159.00	569.06	755.73	11.15	-0.56	-19.38	532374.23	1710429.14	N 39 57 25.50 W	80 31 58.70	4.91
	6364.00	34.83	36.52	6123.08	4973.81	169.10	588.89	772.11	7.75	-0.31	-13.53	532394.05	1710445.53	N 39 57 25.69 W	80 31 58.50	4.94
	6408.00	36.12	31.82	6158.92	5009.65	181.30	610.01	786.43	6.86	2.93	-10.68	532415.17	1710459.84	N 39 57 25.90 W	80 31 58.32	4.96
	6456.00	37.89	29.16	6197.25	5047.98	196.71	634.91	801.07	4.97	3.69	-5.54	532440.07	1710474.49	N 39 57 26.15 W	80 31 58.13	4.99
	6501.00	40.40	29.00	6232.15	5082.88	212.43	659.73	814.88	5.58	5.58	-0.36	532464.89	1710488.29	N 39 57 26.40 W	80 31 57.96	5.01
	6589.00	45.22	33.65	6296.70	5147.43	243.44	710.71	846.04	6.55	5.48	5.28	532515.87	1710519.45	N 39 57 26.91 W	80 31 57.56	5.06
	6635.00	46.38	24.08	6328.81	5179.54	261.78	739.54	861.90	15.12	2.52	-20.80	532544.70	1710535.31	N 39 57 27.19 W	80 31 57.37	5.11
	6678.00	49.27	16.00	6357.70	5208.43	283.38	769.45	872.75	15.45	6.72	-18.79	532574.60	1710546.16	N 39 57 27.49 W	80 31 57.23	5.15
	6722.00	50.86	11.04	6385.96	5236.69	308.90	802.23	880.62	9.37	3.61	-11.27	532607.39	1710554.02	N 39 57 27.81 W	80 31 57.13	5.18
	6766.00	54.26	5.16	6412.72	5263.45	337.38	836.79	885.49	13.12	7.73	-13.36	532641.95	1710558.90	N 39 57 28.16 W	80 31 57.08	5.21
	6811.00	59.25	0.15	6437.39	5288.12	369.98	874.36	887.19	14.47	11.09	-11.13	532679.51	1710560.60	N 39 57 28.53 W	80 31 57.06	5.25
	6856.00	63.79	355.41	6458.85	5309.58	405.79	913.86	885.62	13.69	10.09	-10.53	532719.01	1710559.03	N 39 57 28.92 W	80 31 57.09	5.28
	6901.00	67.45	351.20	6477.43	5328.16	444.15	954.54	880.83	11.78	8.13	-9.36	532759.69	1710554.23	N 39 57 29.32 W	80 31 57.15	5.31
	6945.00	69.90	347.21	6493.43	5344.16	483.44	994.79	873.14	10.12	5.57	-9.07	532799.93	1710546.55	N 39 57 29.72 W	80 31 57.26	5.34
	6990.00	72.43	344.53	6507.96	5358.69	524.90	1036.08	862.74	7.96	5.62	-5.96	532841.22	1710536.15	N 39 57 30.12 W	80 31 57.40	5.37
	7035.00	75.25	342.06	6520.49	5371.22	567.38	1077.47	850.31	8.19	6.27	-5.49	532882.61	1710523.72	N 39 57 30.53 W	80 31 57.56	5.39
	7080.00	77.60	339.58	6531.05	5381.78	610.67	1118.78	835.94	7.48	5.22	-5.51	532923.92	1710509.35	N 39 57 30.94 W	80 31 57.75	5.42
	7125.00	80.12	335.58	6539.75	5390.48	654.65	1159.58	819.50	10.36	5.60	-8.89	532964.71	1710492.51	N 39 57 31.34 W	80 31 57.98	5.44
	7169.00	81.72	331.45	6546.70	5397.43	698.09	1198.45	799.72	9.96	3.64	-9.39	533003.59	1710473.13	N 39 57 31.72 W	80 31 58.23	5.47
	7214.00	84.39	327.84	6552.14	5402.87	742.68	1236.99	777.15	9.93	5.93	-8.02	533042.12	1710450.56	N 39 57 32.10 W	80 31 58.53	5.49

4705101527

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	7259.00	87.46	323.71	6555.34	5406.07	787.23	1274.09	751.91	11.42	6.82	-9.18	533079.22	1710425.32	N 39 57 32.46 W	80 31 58.86	5.52
	7304.00	88.87	321.09	6556.78	5407.51	831.47	1309.72	724.47	6.61	3.13	-5.82	533114.85	1710397.88	N 39 57 32.81 W	80 31 59.21	5.54
	7385.00	89.00	318.92	6558.28	5409.01	910.48	1371.76	672.42	2.68	0.16	-2.68	533176.89	1710345.84	N 39 57 33.42 W	80 31 59.89	5.57
	7475.00	89.62	318.86	6559.37	5410.10	997.87	1439.56	613.25	0.69	0.69	-0.07	533244.69	1710286.67	N 39 57 34.08 W	80 32 0.66	5.60
	7560.00	90.03	319.03	6559.63	5410.36	1080.43	1503.66	557.42	0.52	0.48	0.20	533308.78	1710230.85	N 39 57 34.71 W	80 32 1.39	5.62
	7649.00	91.07	319.42	6558.77	5409.50	1166.98	1571.05	499.30	1.25	1.17	0.44	533376.17	1710172.73	N 39 57 35.37 W	80 32 2.14	5.65
	7740.00	91.30	318.89	6556.89	5407.62	1255.43	1639.88	439.80	0.63	0.25	-0.58	533444.99	1710113.23	N 39 57 36.04 W	80 32 2.92	5.67
	7831.00	91.92	319.01	6554.33	5405.06	1343.79	1708.48	380.06	0.69	0.68	0.13	533513.59	1710053.49	N 39 57 36.71 W	80 32 3.70	5.70
	7921.00	92.37	318.51	6550.97	5401.70	1431.08	1776.10	320.78	0.75	0.50	-0.56	533581.21	1709994.21	N 39 57 37.37 W	80 32 4.47	5.72
	8012.00	93.09	318.87	6546.63	5397.36	1519.27	1844.38	260.77	0.88	0.79	0.40	533649.49	1709934.21	N 39 57 38.04 W	80 32 5.25	5.74
	8101.00	93.78	318.37	6541.30	5392.03	1605.44	1911.04	202.04	0.96	0.78	-0.56	533716.14	1709875.48	N 39 57 38.69 W	80 32 6.01	5.77
	8191.00	94.23	318.90	6535.01	5385.74	1692.53	1978.42	142.71	0.77	0.50	0.59	533783.52	1709816.15	N 39 57 39.35 W	80 32 6.78	5.79
	8281.00	92.20	318.23	6529.97	5380.70	1779.67	2045.78	83.25	2.37	-2.26	-0.74	533850.88	1709756.69	N 39 57 40.01 W	80 32 7.56	5.81
	8370.00	88.80	317.75	6529.19	5379.92	1865.73	2111.90	23.70	3.86	-3.82	-0.54	533917.00	1709697.14	N 39 57 40.66 W	80 32 8.33	5.84
	8460.00	90.41	318.71	6529.81	5380.54	1952.87	2179.02	-36.25	2.08	1.79	1.07	533984.11	1709637.20	N 39 57 41.32 W	80 32 9.11	5.86
	8549.00	90.41	319.80	6529.17	5379.90	2039.43	2246.45	-94.34	1.22	0.00	1.22	534051.54	1709579.11	N 39 57 41.98 W	80 32 9.87	5.88
	8639.00	90.14	320.71	6528.74	5379.47	2127.32	2315.65	-151.88	1.05	-0.30	1.01	534120.73	1709521.57	N 39 57 42.65 W	80 32 10.62	5.90
	8728.00	89.79	321.49	6528.80	5379.53	2214.50	2384.91	-207.77	0.96	-0.39	0.88	534189.99	1709465.69	N 39 57 43.33 W	80 32 11.34	5.92
	8818.00	89.38	321.91	6529.45	5380.18	2302.85	2455.54	-263.55	0.65	-0.46	0.47	534260.62	1709409.91	N 39 57 44.02 W	80 32 12.07	5.94
	8907.00	89.35	321.87	6530.43	5381.16	2390.26	2525.56	-318.47	0.06	-0.03	-0.04	534330.64	1709354.99	N 39 57 44.71 W	80 32 12.79	5.95
	8997.00	89.42	321.92	6531.40	5382.13	2478.66	2596.37	-374.01	0.10	0.08	0.06	534401.45	1709299.46	N 39 57 45.40 W	80 32 13.51	5.97
	9087.00	89.28	321.73	6532.42	5383.15	2567.04	2667.12	-429.63	0.26	-0.16	-0.21	534472.19	1709243.84	N 39 57 46.09 W	80 32 14.23	5.98
	9176.00	89.52	322.77	6533.35	5384.08	2654.56	2737.49	-484.11	1.20	0.27	1.17	534542.56	1709189.35	N 39 57 46.78 W	80 32 14.95	6.00
	9265.00	89.48	322.77	6534.13	5384.86	2742.22	2808.35	-537.96	0.04	-0.04	0.00	534613.41	1709135.51	N 39 57 47.48 W	80 32 15.65	6.02
	9355.00	89.31	323.05	6535.08	5385.81	2830.91	2880.14	-592.23	0.36	-0.19	0.31	534685.20	1709081.24	N 39 57 48.18 W	80 32 16.35	6.03
	9444.00	89.35	323.16	6536.12	5386.85	2918.66	2951.31	-645.66	0.13	0.04	0.12	534756.37	1709027.82	N 39 57 48.88 W	80 32 17.05	6.05
	9533.00	90.38	324.47	6536.33	5387.06	3008.57	3024.75	-699.38	1.83	1.13	1.44	534829.81	1708974.10	N 39 57 49.60 W	80 32 17.75	6.06
	9623.00	90.34	325.12	6535.78	5386.51	3095.73	3096.66	-750.11	0.74	-0.05	0.74	534901.71	1708923.37	N 39 57 50.30 W	80 32 18.41	6.08
	9713.00	90.52	324.46	6535.11	5385.84	3184.87	3170.19	-802.00	0.76	0.20	-0.73	534975.23	1708871.48	N 39 57 51.02 W	80 32 19.09	6.09
	9803.00	90.34	323.93	6534.43	5385.16	3273.88	3243.18	-854.65	0.62	-0.20	-0.59	535048.22	1708818.83	N 39 57 51.74 W	80 32 19.78	6.11
	9892.00	90.52	323.37	6533.76	5384.49	3314.85	3314.85	-907.40	0.66	0.20	-0.63	535119.90	1708766.08	N 39 57 52.44 W	80 32 20.47	6.12
	9982.00	90.58	323.16	6532.90	5383.63	3450.55	3386.98	-961.23	0.24	0.07	-0.23	535192.02	1708712.26	N 39 57 53.15 W	80 32 21.17	6.14
	10072.00	90.48	322.29	6532.07	5382.80	3539.18	3458.59	-1015.74	0.97	-0.11	-0.97	535263.63	1708657.75	N 39 57 53.85 W	80 32 21.88	6.15
	10161.00	90.58	322.35	6531.24	5381.97	3626.72	3529.03	-1070.14	0.13	0.11	0.07	535334.06	1708603.36	N 39 57 54.54 W	80 32 22.59	6.16
	10251.00	90.48	322.40	6530.41	5381.14	3715.26	3600.31	-1125.08	0.12	-0.11	0.06	535405.33	1708548.42	N 39 57 55.24 W	80 32 23.30	6.17
	10341.00	90.52	323.04	6529.63	5380.36	3803.90	3671.91	-1179.59	0.71	0.04	0.71	535476.94	1708493.91	N 39 57 55.94 W	80 32 24.01	6.19
	10430.00	90.31	322.86	6528.98	5379.71	3891.61	3742.94	-1233.21	0.31	-0.24	-0.20	535547.97	1708440.29	N 39 57 56.63 W	80 32 24.71	6.20
	10520.00	90.45	323.05	6528.38	5379.11	3980.31	3814.78	-1287.43	0.26	0.16	0.21	535619.80	1708386.07	N 39 57 57.34 W	80 32 25.42	6.21
	10609.00	90.55	323.91	6527.61	5378.34	4068.16	3886.30	-1340.39	0.97	0.11	0.97	535691.31	1708333.11	N 39 57 58.04 W	80 32 26.11	6.23
	10699.00	90.38	324.03	6526.88	5377.61	4157.12	3959.08	-1393.33	0.23	-0.19	0.13	535764.09	1708280.18	N 39 57 58.75 W	80 32 26.80	6.24
	10788.00	90.58	324.66	6526.13	5376.86	4245.17	4031.39	-1445.21	0.74	0.22	0.71	535836.40	1708228.31	N 39 57 59.46 W	80 32 27.48	6.25
	10878.00	90.79	324.42	6525.06	5375.79	4334.25	4104.69	-1497.41	0.35	0.23	-0.27	535909.70	1708176.10	N 39 58 0.18 W	80 32 28.16	6.26
	10968.00	90.86	324.19	6523.76	5374.49	4423.28	4177.78	-1549.92	0.27	0.08	-0.26	535982.78	1708123.60	N 39 58 0.89 W	80 32 28.85	6.27
	11057.00	90.79	323.46	6522.48	5373.21	4511.20	4249.61	-1602.45	0.82	-0.08	-0.82	536054.61	1708071.07	N 39 58 1.60 W	80 32 29.53	6.28
	11146.00	90.79	323.39	6521.25	5371.98	4599.03	4321.08	-1655.48	0.08	0.00	-0.08	536126.08	1708018.05	N 39 58 2.30 W	80 32 30.22	6.30
	11236.00	90.86	323.15	6519.95	5370.68	4687.81	4393.20	-1709.29	0.28	0.08	-0.27	536198.20	1707964.23	N 39 58 3.00 W	80 32 30.92	6.31
	11326.00	90.69	322.37	6518.75	5369.48	4775.47	4464.05	-1763.15	0.90	-0.19	-0.88	536269.04	1707910.38	N 39 58 3.70 W	80 32 31.63	6.32
	11416.00	90.79	321.71	6517.59	5368.32	4863.91	4535.00	-1818.50	0.74	0.11	-0.73	536339.99	1707855.03	N 39 58 4.39 W	80 32 32.35	6.33
	11506.00	91.13	321.78	6516.10	5366.83	4951.27	4604.88	-1873.60	0.39	0.38	0.08	536409.87	1707799.93	N 39 58 5.08 W	80 32 33.07	6.34

2014

4705101527

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S °'")	Longitude (E/W °'")	Directional Difficulty Index
	11594.00	91.10	321.61	6514.35	5365.08	5039.60	4675.49	-1929.38	0.19	-0.03	-0.19	536480.47	1707744.16	N 39 58 5.77 W	80 32 33.79	6.35
	11683.00	90.93	321.42	6512.77	5363.50	5126.90	4745.15	-1984.75	0.29	-0.19	-0.21	536550.13	1707688.78	N 39 58 6.45 W	80 32 34.51	6.36
	11773.00	90.41	321.98	6511.72	5362.45	5215.24	4815.77	-2040.53	0.85	-0.58	0.62	536620.75	1707633.01	N 39 58 7.14 W	80 32 35.24	6.37
	11863.00	90.38	321.86	6511.10	5361.83	5303.65	4886.62	-2096.04	0.14	-0.03	-0.13	536691.59	1707577.51	N 39 58 7.84 W	80 32 35.97	6.38
	11952.00	90.45	322.71	6510.45	5361.18	5391.18	4957.02	-2150.48	0.96	0.08	0.96	536761.99	1707523.07	N 39 58 8.53 W	80 32 36.67	6.39
	12042.00	90.41	322.48	6509.78	5360.51	5479.78	5028.51	-2205.15	0.26	-0.04	-0.26	536833.47	1707468.40	N 39 58 9.23 W	80 32 37.39	6.40
	12132.00	90.55	323.20	6509.02	5359.75	5568.45	5100.23	-2259.51	0.81	0.16	0.80	536905.19	1707414.04	N 39 58 9.93 W	80 32 38.10	6.41
	12221.00	90.38	323.27	6508.30	5359.03	5656.24	5171.53	-2312.78	0.21	-0.19	0.08	536976.49	1707360.77	N 39 58 10.63 W	80 32 38.79	6.42
	12310.00	90.62	323.59	6507.52	5358.25	5744.07	5243.00	-2365.80	0.45	0.27	0.36	537047.96	1707307.75	N 39 58 11.33 W	80 32 39.48	6.43
	12400.00	90.52	323.87	6506.63	5357.36	5832.97	5315.56	-2419.04	0.33	-0.11	0.31	537120.51	1707254.51	N 39 58 12.04 W	80 32 40.18	6.44
	12489.00	90.14	323.75	6506.12	5356.85	5920.90	5387.39	-2471.59	0.45	-0.43	-0.13	537192.34	1707201.97	N 39 58 12.74 W	80 32 40.86	6.45
	12578.00	89.86	323.47	6506.12	5356.85	6008.78	5459.03	-2524.39	0.44	-0.31	-0.31	537263.98	1707149.17	N 39 58 13.44 W	80 32 41.55	6.46
	12668.00	89.97	323.99	6506.25	5356.98	6097.68	5531.58	-2577.65	0.57	0.12	0.56	537336.53	1707095.91	N 39 58 14.15 W	80 32 42.25	6.47
	12757.00	90.45	323.51	6505.92	5356.65	6185.59	5603.35	-2630.29	0.75	0.54	-0.52	537408.29	1707043.28	N 39 58 14.86 W	80 32 42.93	6.48
	12846.00	90.41	323.31	6505.26	5355.99	6273.43	5674.81	-2683.34	0.23	-0.04	-0.22	537479.74	1706990.23	N 39 58 15.56 W	80 32 43.63	6.49
	12936.00	90.79	323.64	6504.31	5355.04	6362.26	5747.12	-2736.90	0.56	0.42	0.37	537552.06	1706936.67	N 39 58 16.27 W	80 32 44.32	6.50
	13025.00	90.52	324.10	6503.30	5354.03	6450.20	5819.00	-2789.37	0.60	-0.30	0.52	537623.93	1706884.20	N 39 58 16.97 W	80 32 45.01	6.51
	13115.00	90.34	323.99	6502.62	5353.35	6539.17	5891.85	-2842.21	0.23	-0.20	-0.12	537696.78	1706831.36	N 39 58 17.68 W	80 32 45.70	6.52
	13204.00	90.52	323.96	6501.95	5352.68	6627.14	5963.83	-2894.56	0.21	0.20	-0.03	537768.76	1706779.02	N 39 58 18.39 W	80 32 46.38	6.52
	13293.00	90.45	324.46	6501.20	5351.93	6715.16	6036.02	-2946.60	0.57	-0.08	0.56	537840.94	1706726.98	N 39 58 19.10 W	80 32 47.06	6.53
	13383.00	90.38	324.06	6500.55	5351.28	6804.19	6109.07	-2999.17	0.45	-0.08	-0.44	537913.99	1706674.41	N 39 58 19.81 W	80 32 47.75	6.54
	13472.00	90.48	324.76	6499.88	5350.61	6892.25	6181.44	-3050.97	0.79	0.11	0.79	537986.36	1706622.62	N 39 58 20.52 W	80 32 48.42	6.55
	13561.00	90.45	324.84	6499.16	5349.89	6980.41	6254.17	-3102.27	0.10	-0.03	0.09	538059.08	1706571.32	N 39 58 21.23 W	80 32 49.09	6.56
	13651.00	90.72	325.42	6498.24	5348.97	7069.62	6328.00	-3153.72	0.71	0.30	0.64	538132.91	1706519.87	N 39 58 21.96 W	80 32 49.76	6.57
	13740.00	90.38	324.35	6497.38	5348.11	7157.79	6400.80	-3204.91	1.26	-0.30	-1.20	538205.71	1706468.68	N 39 58 22.67 W	80 32 50.43	6.58
	13830.00	90.45	323.05	6496.73	5347.46	7246.68	6473.33	-3258.19	1.45	0.08	-1.44	538278.23	1706415.40	N 39 58 23.38 W	80 32 51.13	6.59
	13919.00	90.31	321.28	6496.14	5346.87	7334.17	6543.62	-3312.78	1.99	-0.16	-1.99	538348.51	1706360.82	N 39 58 24.07 W	80 32 51.84	6.60
	14008.00	90.27	319.50	6495.69	5346.42	7421.12	6612.18	-3369.52	2.00	-0.04	-2.00	538417.07	1706304.08	N 39 58 24.74 W	80 32 52.58	6.61
Final Survey 19Dec12	14078.00	90.48	318.36	6495.23	5345.96	7489.11	6664.95	-3415.50	1.66	0.30	-1.63	538469.84	1706258.10	N 39 58 25.26 W	80 32 53.18	6.62
Projection to Bit	14158.00	90.48	318.36	6494.56	5345.29	7566.61	6724.74	-3468.66	0.00	0.00	0.00	538529.63	1706204.95	N 39 58 25.84 W	80 32 53.87	6.62

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size Casing Diameter (in)	Survey Tool Type	Borehole / Survey
Act Sins	0.000	17.800		30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / Noble Energy SHL-8G-HS Gyro+MWD 0' to 14158' MD
Act Sins	17.800	2839.500		30.000	SLB_NSG+MSHOT	Original Borehole / Noble Energy SHL-8G-HS Gyro+MWD 0' to
Act Sins	2839.500	14078.000		30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-8G-HS Gyro+MWD 0' to

02/28/2014

4705101527

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ° °)	Longitude (E/W ° ° °)	Directional Difficulty Index
	14078.000		14158.000		Act Sins	30.000	30.000	SLB_BLIND+TREND								

02/28/2014

Original Borehole / Noble Energy
SHL-8G-HS Gyro+MWD 0' to